

MUSICH, N.I.

"Farming practices on collective farms of Olekminsk District in the Yakut A.S.S.R"

p. 71 Trudy Akad. Nauk SSSR, Yakutsk Filial, No. 1, 1956.

Country : USSR  
Category : Soil Science. Fertilizers. Organic Fertilizers. J

Abs Jour : RZhBiol., No 6, 1959, No 24654

Author : Musich, N. I.  
Inst : Yakutsk Branch AS USSR.  
Title : Concerning the Application of Organic Mineral Mixtures in Central Yakutia.

Orig Pub : Dokl. na 8-y nauchn. sessii (Yakutskiy fil. AN SSSR). Botan., pochvoved. zool., zootekhnika. Yakutsk, 1957 (1958), 67-75

Abstract : In small-plot experiments with winter rye in Yakutia, the effectiveness of 5 t/ha of humus, 5 t/ha of compost, a mixture of humus with manure liquor and 5c/ha of ashes and mixtures of organic fertilizers with ashes were compared. At the application of the fertilizers before sowing, ashes proved to be more effective than

Card : 1/4

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Country : USSR  
Category : Soil Science. Fertilizers. Organic Fertilizers. J

Abs Jour : RZhBiol., No 6, 1959, No 24654

Author :  
Inst :  
Title :

Orig Pub :

Abstract : ashes gave a smaller increment than the application of organic fertilizers. The vernal additional forage was even less effective. In the experiment with corn on unfertilized ground, 89.8 c/ha of the greens were obtained; the hazardous application of 40 t/ha of manure increased the harvest to 197.7 c/ha, whereas the best variant of the organic-mineral mixture at the

Card : 3/4

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-----, NO 6, 1959, NO 24654

Author :  
Title :

MUSICH, N.I., kandidat sel'skokhozyaystvennykh nauk; KORNIIYENKO, A.D.

Characteristics of the agricultural system in Yakutia. Zemledelie  
5 no.4:3-7 Ap '57. (MLBA 10:6)

1. Institut biologii Yakutskogo filiala Akademii nauk SSSR (for  
Musich). 2. Yakutskiy nauchno-issledovatel'skiy institut sel'skogo  
khozyaystva (for Korniyenko).  
(Yakutia—Agriculture)

MUSICH, N.J.

Methods of growing local (organic) fertilizers and their effectiveness in Yakutia. Trudy Inst. biol. Lening SSSR no. 116-126 '67.  
(MIRA 10:7)

(Yakutia--Fertilizers)

Musički, D.

✓ Musički, D. Application du principe de Pfaff en mécanique quantique. Glas Srpske Akad. Nauka 221, Od. Prirod.-Mat. Nauka (N.S.) 9 (1956), 45-53. (Serbo-Croatian. French summary)

2  
I-FW

L'auteur démontre que l'équation de Schrödinger pour les états stationnaires peut être déduite du principe de Pfaff tel qu'il a été formulé par Bilimovitch [cf. MR 6, 243]. A cet effet on part des expressions pour l'énergie cinétique et potentielle des ondes de matière. Dans le cas envisagé, le principe de Pfaff est équivalent au principe du minimum de l'énergie. *Résumé de l'auteur.*

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MUSICKI, DORDO

Musicki, Dordo. — L'équation relativiste des ondes de  
matière et le principe de Pfaff. Glas Srpske Akad.  
Nauka 221, Od. Prirod.-Mat. Nauka (N. S.) 9 (1956),  
55-62. (Serbo-Croatian. French summary)

2  
I-FW

En partant de l'élément d'action relativiste des ondes  
de matière, cet élément étant pris comme une forme de  
Pfaff, on déduit l'équation de Klein-Gordon des ondes  
de matière par l'application du principe de Pfaff dans  
la forme qui lui a été donnée par A. Bilimovitch [cf.  
MR 6, 243].  
*Résumé de l'auteur.*

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Musicki, D. L'application du principe de Pfaff en mécanique quantique. Bull. Acad. Serbe Sci. Cl. Sci. Math. Nat. (N.S.) 10 (1956), no. 2, 25-28.

A. D. Bilimovitch [Glas Srpske Akad. Nauka 189 (1946), 121-152; MR 11, 218] formulated the so-called Pfaff's general principle of mechanics from which it is possible, as shown by himself and Angelitch (Anđelić), to deduce various differential equations of motion in mechanics. These equations are Pfaff's equations attached to a particular Pfaffian form which is a specially modified element of action in Hamilton's sense. In this paper it is shown that it is possible to deduce from the Pfaff's principle, after some generalizations, the Schrödinger's equation for stationary states also, starting from the kinetic and potential energy of the waves of matter.

T. P. Anđelić (Belgrade)

"The Application of Pfaff's Principle of Quantum Mechanics"<sup>TK</sup>

Card 1/1

2  
Musicki, D. L'équation relativiste des ondes de la matière  
et le principe de Pfaff. Bull. Acad. Serbe Sci. Cl. Sci.  
Math. Nat. (N.S.) 10 (1956), no. 2, 29-31.  
The author demonstrates here how it is possible (cf. the

above review) to deduce from Pfaff's principle the Klein-  
Gordon equation for waves of matter. T. P. Andelic.

"The Relativity Wave Equation" of Matter and the  
Principal of Pfaff."

Card 1/1

MUSICKI, D.

The Pfaff method and its application in theoretical physics. p. 179  
(GLASNIK, No. 50, 1956 (Published 1957))

SO: Monthly list of East European Accessions (ELAL) LC Vol. 6, no. 12, Dec. 1957  
Uncl.

MUSICKI, D. (Beograd)

An electrodynamic axiom. Zbornik rad Mat inst SAN 69:59-72 '60.  
(EBAI 10:8)

(Electrodynamics)

MUSICKI, Djordje

Generalization of the Pfaff-Bilimovic method in the field theory. Publ Inst math SAU 2(16):5-20 '62 [publ. '63].

MUSICKI, Djordje

Canonical transformations and the Hamilton-Jacobi method  
in the field theory. Publ Inst math SANU 2(16):21-34  
'62 [publ. '63].

MUSICKI, Dorde, dr, docent (Beograd, Kralja Vladimira 9c)

Generalization of the Pfaff-Bilimovic method in field theory. Tehnika Jug 18 no. 8: 1392-1399 Ag '63.

1. Prirodno-matematički fakultet Univerziteta u Beogradu.

MUSICKI, Dorde, dr, docent

Canonical transformations and the Hamilton-Jacobi method  
in field theory. Tehnika Jug 18 no. 8: 1400-1407 Ag '63.

KOZŁOWSKI, St.; MUSIEL, A.

Studies on the development of *Spinturnix vespertilionis* (L.).  
Wiadomości parazyt. 7 no.2:233-235 '61.

1. Zakład Parazytologii Lekarskiej P.Z.H., Warszawa.

(PARASITES) (MAMMALS parasitol)

MUSIEL, Adam

Studies on the external segmentation of parasitic *Gamasides*  
(Parasitiformes). Acta parasit Pol 12 no.1/12:47-64 '64.

1. Department of Medical Parasitology, State Institute of  
Hygiene, Warsaw. Head:Dr. Zofia Dymowska.

MUSIELAK, J.

✓ Kopel, J., and Musielak, J. On the estimation of the norm of the  $n$ -linear symmetric operation. *Studia Math.* 15 (1955), 29-30.

1 - F/R

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Math

If  $X$  and  $Y$  are normed linear spaces a continuous symmetric  $n$ -linear on  $X^n$  to  $Y$  is a function  $U(x_1, \dots, x_n)$  with values in  $Y$  which is linear as a function of  $x_k$  ( $k=1, \dots, n$ ) and unaltered in value by a permutation of  $x_1, \dots, x_n$ . If  $x_1 = \dots = x_n = x$ ,  $U(x_1, \dots, x_n)$  is denoted by  $U(x)$  and called a power of degree  $n$ . Let

$$M_n = \sup \|U(x_1, \dots, x_n)\| \text{ for } \|x_k\| \leq 1,$$
$$P_n = \sup \|U(x)\| \text{ for } \|x\| \leq 1.$$

The present paper shows by an example that for each  $n$  it is possible to have  $M_n = (n^n/n!)P_n$ . The spaces chosen are  $X=L(0, 1)$ ,  $Y$  the space of reals. It has long been known that  $M_n \leq (n^n/n!)P_n$ . This result is given in the thesis of R. S. Martin [California Inst. Tech. 1932; unpublished], and the argument is reproduced in a paper by the reviewer [Tôhoku Math. J. 44 (1938), 302-318]. It was proved by Banach [Studia Math. 7 (1938), 36-44] that  $M_n = P_n$  if  $X$  is a separable Hilbert space and  $Y$  is any normed linear space. The reviewer, in a talk at Princeton in 1938, gave an example in which  $M_n = (n^n/n!)P_n$ . It is  $U(x) = \xi_1 \xi_2 \dots \xi_n$  with  $X$  the  $n$ -dimensional space of  $x = (\xi_1, \dots, \xi_n)$  with  $\|x\| = |\xi_1| + \dots + |\xi_n|$  and  $Y$  the space of scalars. A. E. Taylor (Los Angeles, Calif.)

Handwritten signature

MUSIELAK, J.

Musielak, J. and Orlicz, W. Linear functionals over the space of functions continuous in an open interval. Studia Math. 15 (1956), 216-224.

If  $C(a, b)$  is the set of bounded continuous functions in the open interval  $(a, b)$  and if  $a < t_1' < t_1'' < b$ ,  $t_n' \uparrow a$ ,  $t_n'' \uparrow b$ , one can renorm the unit sphere of  $C(a, b)$  by use of the formula  $\|x\|_a = \sum_{n=1}^{\infty} 2^{-n} \|x\|_n$ , where

$$\|x\|_n = \sup \{|x(t)| \mid t_n' \leq t \leq t_n''\}.$$

The renormed unit sphere is denoted by  $K_s(a, b)$  (a Saks space) and a functional  $\xi$  on  $K_s(a, b)$  is called linear if  $x_1, x_2, \lambda_1 x_1 + \lambda_2 x_2 \in K_s(a, b)$  implies  $\xi(\lambda_1 x_1 + \lambda_2 x_2) = \lambda_1 \xi(x_1) + \lambda_2 \xi(x_2)$ . The authors secure a representation for such functionals and a theorem concerning the convergence of sequences of such functionals. The basic tool is the Riesz representation of functionals on  $C(I', I'')$ , the set of continuous functions on the closed interval  $\langle I', I'' \rangle$ . The principal result reads as follows: A continuous linear functional  $\xi$  on  $K_s(a, b)$  may be written in the form  $\xi(x) = \int_{a+}^b x(t) dy(t)$  where (a)  $\text{var} \{y(t) \mid a < t \leq b\} < \infty$ , (b)  $y$  is left continuous and (c)  $y(t_0) = 0$  for some  $t_0 \in \langle I', I'' \rangle$ .

B. Gelbaum (Minneapolis, Minn.)

Math 2 4

eye  
Minn

Musiak, Julian. On absolute convergence of Fourier series of some almost periodic functions. Zeszyty Nauk. Univ. Mickiewicza. Mat.-Chem. 1 (1957), 9-17. (Polish. Russian and English summaries)

The author considers the Fourier series  $a_0/2 + \sum a_n \cos \lambda(n)x + b_n \sin \lambda(n)x$  and investigates their absolute convergence. He puts  $M(g(x)) = \lim_T (2T)^{-1} \int_{-T}^T g(x) dx$

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and  $\omega_2(h) = [\sup_{0 < t \leq h} M(|f(x+t) - f(x)|^2)]^{1/2}$ ; further,  $\mu(x)$  is the inverse function to the (monotonic) function  $\lambda(x)$ .  
 Theorem 1: If (4)  $\sum_n [\mu(2^n x) - \mu(2^{n-1} x) + 1]^{1-\gamma} \omega_2^\gamma(2^{-n}) < \infty$  for a function  $f \in B^2$  and a certain number  $\gamma$  in  $0 < \gamma < 2$  then the series (3)  $\sum_n (|a_n|^\gamma + |b_n|^\gamma)$  is convergent. — In the hypothesis of the second theorem,  $\omega_2$  is replaced by a more complicated "continuity expression". Simpler theorems are true in case  $n^\rho = O(\lambda_n)$  for a certain  $\rho > 0$ .  
 For instance, (4) in Theorem 1 can be replaced by  $\sum_n n^{(1-\gamma)/\rho-1} \omega_2^\gamma(n^{-1}) < \infty$  [Th. 3; special cases are due to Szász and Bernstein; see Zygmund, Trigonometrical series, Warszawa-Lwów, 1935, p. 177; and Stečkin, Mat. Sb. N.S. 29(71) (1951), 225-232; MR 13, 229; 15, 28]. Finally, two theorems deal with lacunary series where  $\lambda(n+1)/\lambda(n) > q > 1$ .  
 K. Zeller (Tübingen).

RB  
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MUSIELAK, J.

MUSIELAK, J.

Absolute convergence of Fourier series of some almost periodic functions.

P. 11 (Matematyka, Chemie) Vol. 10, No. 1, 1957, Poznan, Poland

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC. VOL. 7, NO. 1, JAN. 1958

MUSIELAK, J.

On absolute convergence of multiple **Fourier's** series. p.107

ANNALES POLONICI MATHEMATICI (Polska Akademia Nauk)  
Warszawa, Poland  
Vol. 5, no. 2, 1958

Monthly List of East European Accession (EEAI) LC, vol. 9, no. 1, <sup>Jan.</sup>1960

Uncl.

MUSIELAK, J.; ORLICZ, W.

Some remarks on modular spaces. Bul Ac Pol mat 7 no.11:661-668 '59.  
(EAI 9:10)

1. Institute of Mathematics, Polish Academy of Sciences. Presented  
by W.Orlicz.

(Lattice theory) (Spaces, Generalized)

MUSIELAK, J.; Orlicz, W.

On generalized variations. I. In English. p. 11.

STUDIA MATHEMATICA. (Polska Akademia Nauk) Warszawa, Poland. Vol. 18, no. 1, 1959.

Monthly List of East European Accessions (EEAI) Vol. 9, no. 1, Jan. 1960.

Uncl.

MUSIELAK, J.; Orlicz, W.

On modular spaces. In English. p. 49.

STUDIA MATHEMATICA. (Polska Akademia Nauk) Warszawa, Poland, Vol. 18, no. 1, 1959.

Monthly List of East European Accessions (EEAI) <sup>LC,</sup> Vol. 9, no. 1, Jan. 1960

Uncl.

KOPEC, J. (Poznan); MUSIELAK, J. (Poznan)

On quasianalytic classes of functions, expansible in series. Annales  
pol math 7 no.3:285-292 '60. (EEAI 9:10)  
(Functions) (Series)

MUSIELAK, J.; ORLICZ, W.

A generalization of certain extension theorems. *Bul Ac Pol mat* 8  
no.8:531-534 '60.

1. Institute of Mathematics, Polish Academy of Sciences. Presented  
by W. Orlicz.

(Functional analysis)

MUSIELAK, J. (Poznan)

A simple argument for the determinative criterion of a determined square form. Rocznik matematyczny 5:45-46 '61.

MUSIELAK, J. (Poznan)

Sequences of finite M-variation. Kocz prace matem 6:165-174 '61.

MUSIELAK, J.; SEMADENI, Z. (Poznan)

Some classes of Banach spaces depending on a parameter. *Studia math*  
20 no.3:271-284 '61.

(Spaces, Generalized)

MUSIELAK, J. (Poznan)

Approximation theorem for infinitely differentiable functions.  
Rocz prace matem no.7:63-69 '62.

MUSIELAK, J.; ORLICZ, W. (Poznan)

On modular spaces of strongly summable sequences. *Studia math* 22  
no.1:127-146 '62.

MUSIELAK, J. (Poznan;

A note on integrals of distributions. *Prace matemat.*  
8 no.1:1-7 1968.

ALBRYCHT, J.; MUSIELAK, J

On some new classes of functions and distributions. Bul Ac  
Pol math 12 no.7:391-396 '64.

1. Department of Mathematics of the A. Mickiewicz University,  
Poznan. Presented by W. Orlicz.

MUSIENKO, ZDZISLAW

6

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21

Obtaining aluminum oxide, sulfuric acid, and cement by  
 sintering aluminum-bearing materials with anhydrite.  
 Karol Akerman, Bronislaw Zmudzinski, Zofia Orman, and  
 Zdzislaw Musienko. *Arch. Hutnictwa* 1, 319-39(1950)  
 (English summary).--When anhydrite (I) or calcined  $\text{CaSO}_4$   
 is sintered in a rotary furnace with  $\text{Al}_2\text{O}_3$ -rich silicates (II)  
 (argillite or natural or shivered slate) and coke,  $\text{SO}_2$  is  
 evolved (yield 80%) which can be used for  $\text{H}_2\text{SO}_4$  manuf.  
 A high degree (80%) of self-splitting roast is obtained, from  
 which  $\text{Al}_2\text{O}_3$  can be extd. with soda soln. with the yield  
 75-80%. The leaching residue has the compn. of raw ma-  
 terials used for good-quality cement manufacture. The best  
 roasting conditions are: temp. 1280-1320°, the furnace atm.  
 neutral or slightly reducing, grain size of the silicate less  
 than 0.06 mm., the wt. proportion of II to I within 1:3.2 to  
 1:4.2. The coke content is 7.5% in relation to I and should  
 be reduced when slate is used instead of II.

A. K. ha MT

MUSIENOWICZ, ANDRZEJ

Value of ligation of the spermatic cord in castration in the light of morphological studies. Polski przegl. chir. 33 no.4:381-384 '61.

1. Z II Kliniki Chirurgicznej Sl. A.M.Kierownik: prof. dr J.Gasiński.  
(CASTRATION exper)

CZOPIK, Jerzy; MARQUARDT, Marcei; MUSIEROWICZ, Andrezej

Diagnostic difficulties in co-existing renal calculi and cancer.  
Polski przegl. chir. 33 no.6:575-579 '61.

1. Z II Kliniki Chirurgicznej Slaskiej AM w Zabrze Kierownik: prof.  
dr J.Gasinski i ze Szpitala Specjalistycznego nr 2 w Katowicach  
Ordynator: dr J.Zielinski.  
(URINARY CALCULI diag) (KIDNEYS neopl)

ADAMKIEWICZ, Kazimierz; CZOPIK, Jerzy; MUSIEROWICZ, Andrzej

Results of the implantation of the ureter into the bladder. Polski  
przegl. chir. 33 no.11a:1411-1418 '61.

1. Z II Kliniki Chirurgicznej Slaskiej AM w Zabrze Kierownik kliniki:  
prof. dr J. Gasinski.  
(URETERS surg) (BLADDER surg)

ADAMKIEWICZ, Kazimierz; WIECZOREK, Mirosław; CZOPIK, Jerzy; MUSIEROWICZ,  
Andrzej; ZIELINSKI, Jerzy

Effect of decapsulation and enveloping the kidney in the omentum on  
the development of collateral vascularization. Pol. tyg. lek. 17 no.6:  
206-209 5 F '62.

1. Z II Kliniki Chirurgicznej Szl. AM w Zabrze; kierownik: prof. dr  
med. J. Gasinski i z Zakładu Anatomii Patologicznej Szl. AM w Zabrze;  
kierownik: prof. dr med. W. Niepolomski.

(KIDNEYS blood supply) (OMENTUM physiol)

MUSIEROWICZ, Andrzej; CZOPIK, Jerzy

Reinvagination of the posterior urethra with the method of Solovov.  
Pol. przegl. chir. 34 no.10a:1083-1086 '62

1. Z II Kliniki Chirurgicznej Sl. AM Kierownik: prof. dr J. Gasinski.  
(URETHRAL STRICTURE)

MUSIEROWICZ, Andrzej; CZOPIK, Jerzy

3 Cases of congenital valve of the posterior urethra. *Pediat. Pol.*  
37 no.1:71-76 Ja '62.

1. Z II Kliniki Chirurgicznej Slaskiej AM Kierownik: prof. dr med.  
J. Gasinski.

(URETHRA abnorm)

MUSIEROWICZ, Andrzej

Effect of ligation of the spermatic cord on the weight and morphology of the testis and seminal vesicles in the rat.  
Endokr. pol. 14 no.1:101-112 '63.

1. II Klinika Chirurgiczna slaskiej AM w Zabrze Kierownik:  
prof. dr J. Gasinski.

(SEMINAL VESICLES) (SPERMATIC CORD)  
(TESTIS) (STERILIZATION, SEXUAL)  
(PITUITARY GLAND) (ADRENAL GLANDS)

ZWIERZCHOWSKA, Anna; MUSIEROWICZ, Andrzej

Apropos of the diagnosis and management of obturator hernia.  
Pol. tyg. lek. 19 no.44:1696-1697 N 2'64

I. Z C ziału Chirurgicznego Szpitala Wojewodzkiego w War-  
szawie (Ordynator: prof. dr. med. W. Rudowski).

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PROCESSES AND PROPERTIES INDEX

*ca*

The sorption properties of peats in the light of the adsorption formulae of Freundlich.  
 A. M. Mironov, *Russkii Nauch. Zhurnal* 21, 129-32 (1923 German) (1929)  
 --- The sorption of the cations  $Ca^{++}$ ,  $K^+$ ,  $NH_4^+$  as well as anions  $PO_4^{--}$  by 2 peats of different origins (low land peat of Dubliny and high land peat of Mirna) from the notes  $CaSO_4$ ,  $Ca(NO_3)_2$ ,  $CaH_2(PO_4)_2$ ,  $KCl$  and  $(NH_4)_2SO_4$  taken place in agreement with the adsorption formulae of Freundlich  $A = aC^{1/n}$ . Considerable sorption properties were observed in peats investigated. The anion part of sorbed Ca salt soln. has no greater influence on the adsorption degree of  $Ca^{++}$  with the exception of  $CaH_2(PO_4)_2$  where the Mirna peat absorbed it in quite large quantities.  $K^+$  and  $NH_4^+$  are better absorbed from the notes of  $KCl$  and  $(NH_4)_2SO_4$  by low land peat than by high land peat. This difference in sorption may be explained by a higher content of Ca in low land peat. Consequently the Ca fertilisation of high land peat has a favorable influence on the adsorption properties of  $K^+$  and  $NH_4^+$  whereby the washing out of these valuable ions is reduced.

I. Kréna

METALLURGICAL LITERATURE CLASSIFICATION

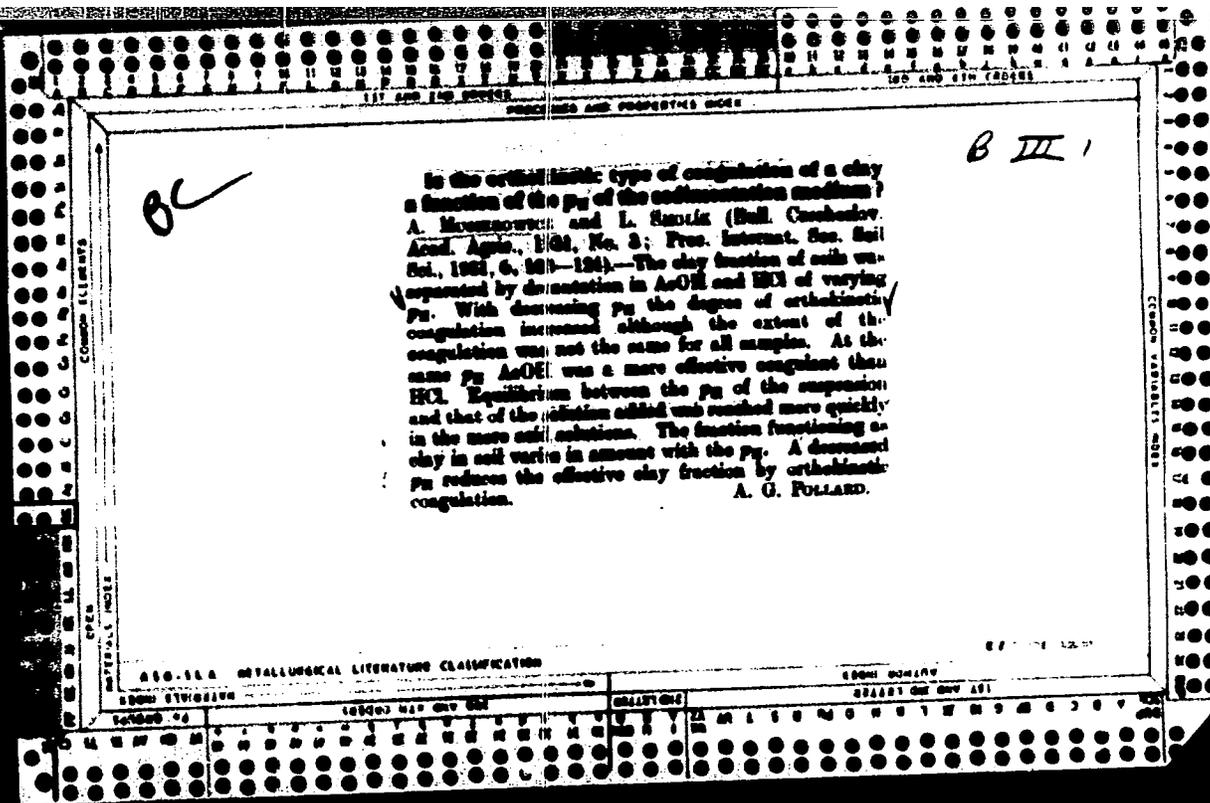
GROUP

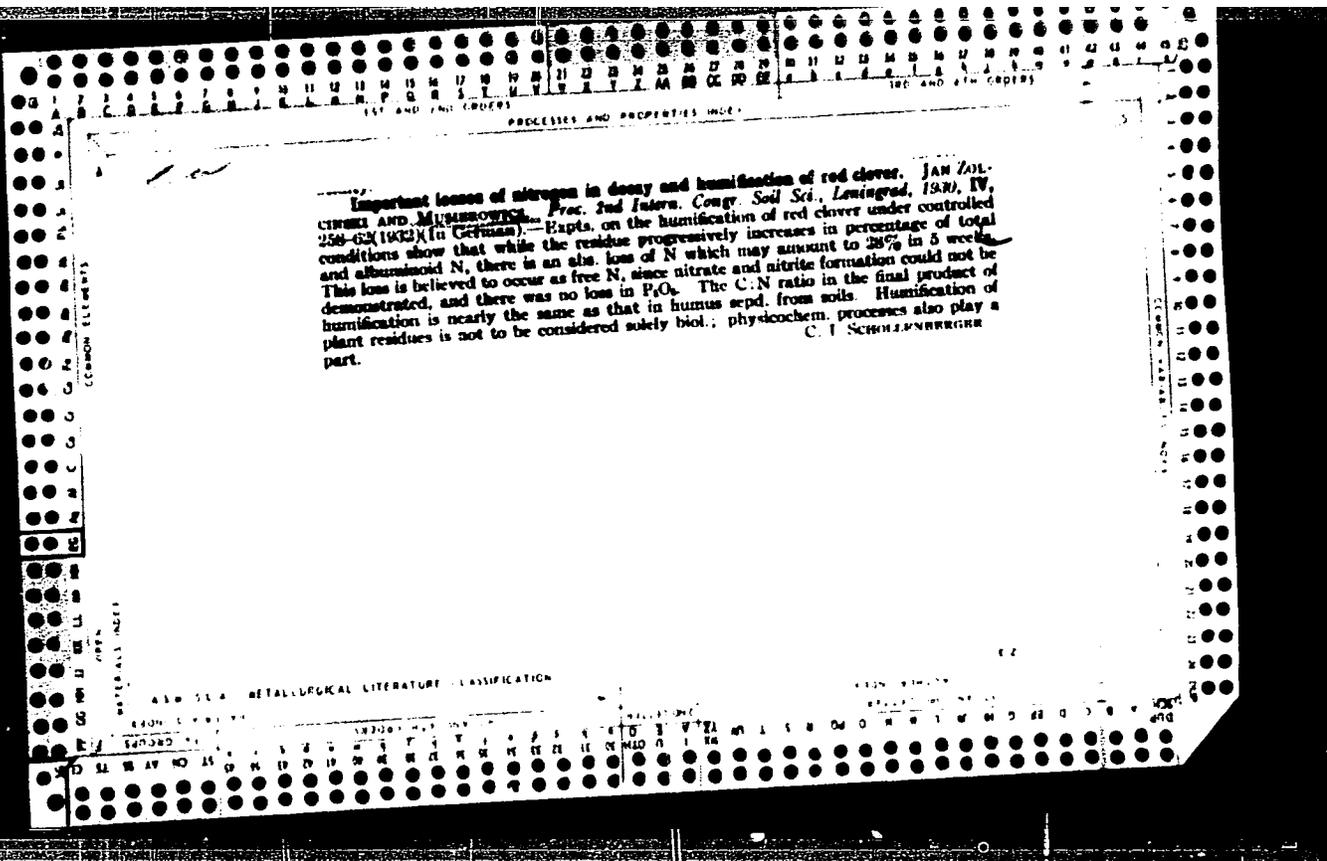
SUBGROUP

SECTION

COLLECTION







MUSIEROWICZ, A.  
G. WIEGNER, Polish Agric Forestal Ann, 1934, 8, 3-3-356

1ST AND 2ND COORDS      3RD AND 4TH COORDS

PROCESSES AND PROPERTIES INDEX

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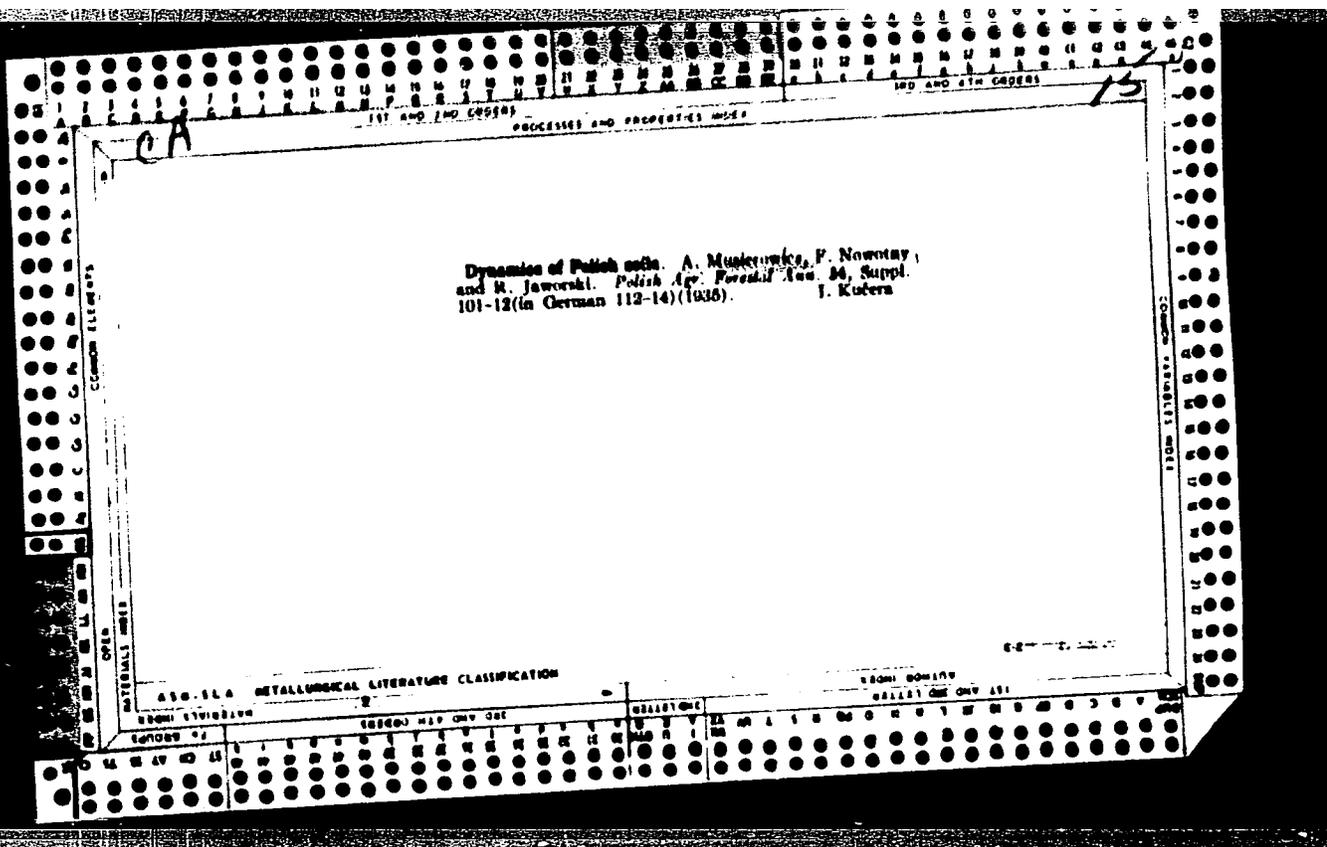
07

Cation exchange in marsh soils. A. Musterswicz. *Polish Ag. Forestal Ann. 29, 220-22 (1920) in German* (1922). Adsorption processes in marshes follow the Freundlich adsorption formula  $a = b_1 c^{b_2}$ . Cation adsorption depends on the kind of cation, the anion with which the cation is combined, the kind of marsh and the kind of cations included in the adsorbing marsh complex. The tendency of cations to enter the marsh complex is in the order  $Na < NH_4 < K < Mg < Ca < Ba < Cu < H$ . The liberation of cations from the adsorbing marsh complex is  $Mg > Ca > Ba > H$ . It is shown how important the Ca ion is in adsorption by marsh soil, in general, and especially in the adsorption of K and  $NH_4$ , how easily Mg is forced out from the org. adsorption complex by other cations, and how large is the adsorption of Cu and H by marsh soil. Jaroslav Kufcra

METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND COORDS      3RD AND 4TH COORDS





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PROCESSED AND PROPERTY INDEX

*ca*

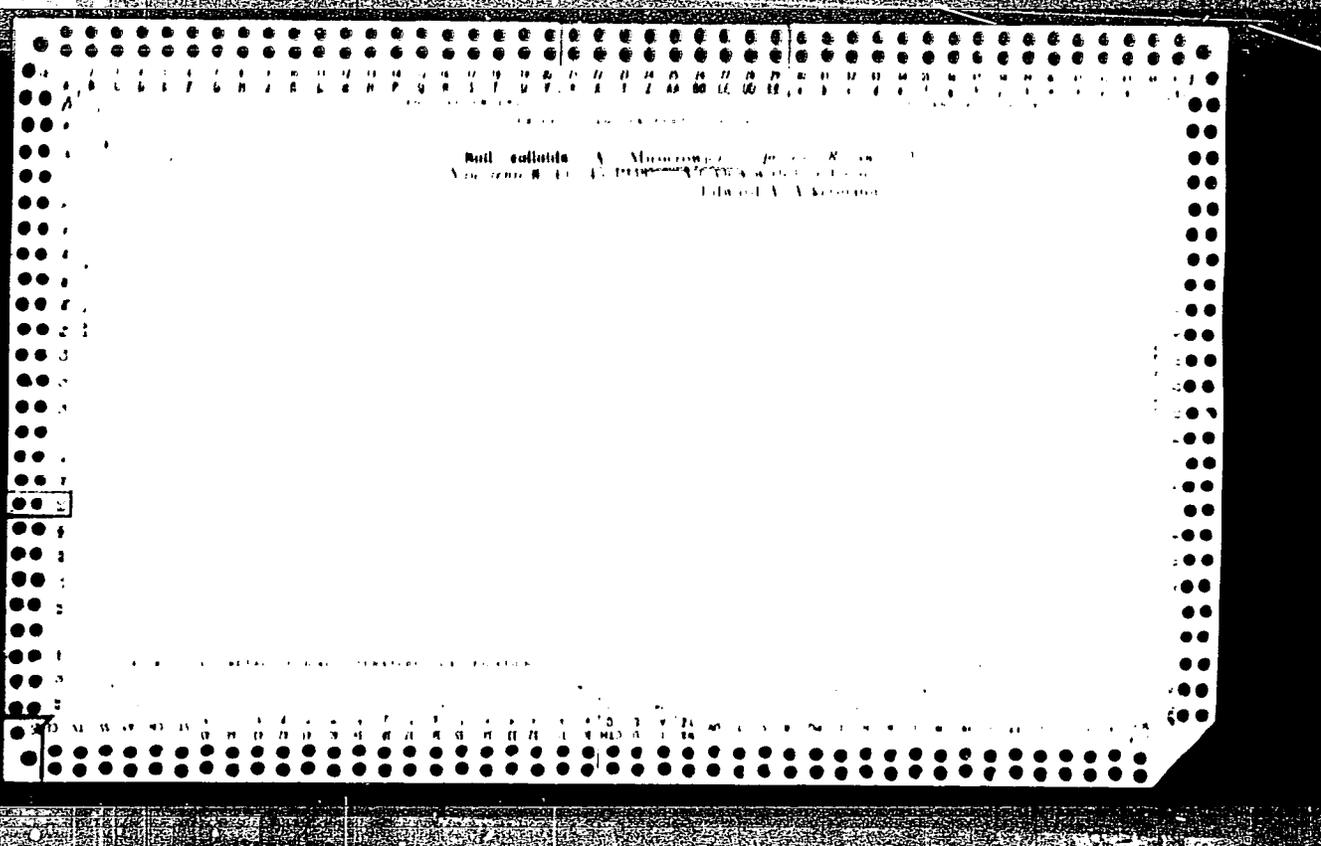
Loam content in Polish potassium fertilizers. A. Mankiewicz. *Polish Agr. Forest Ann.* 43, 267-70 (1937).  
 The loams show an alk. reaction (p. 7.9-7.8). They can be dispersed in water, the particles having diam. more than 0.0001 mm, indicating that they are not colloidal. The colloidal particles in the aggregates are below 3%. The absorption-exchange power of loam is low:

AG-4.62 mg. mol. per 100 g. of loam. K loams have no practical value in agricultural work. J. P. M.

METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON VARIABLE MODES

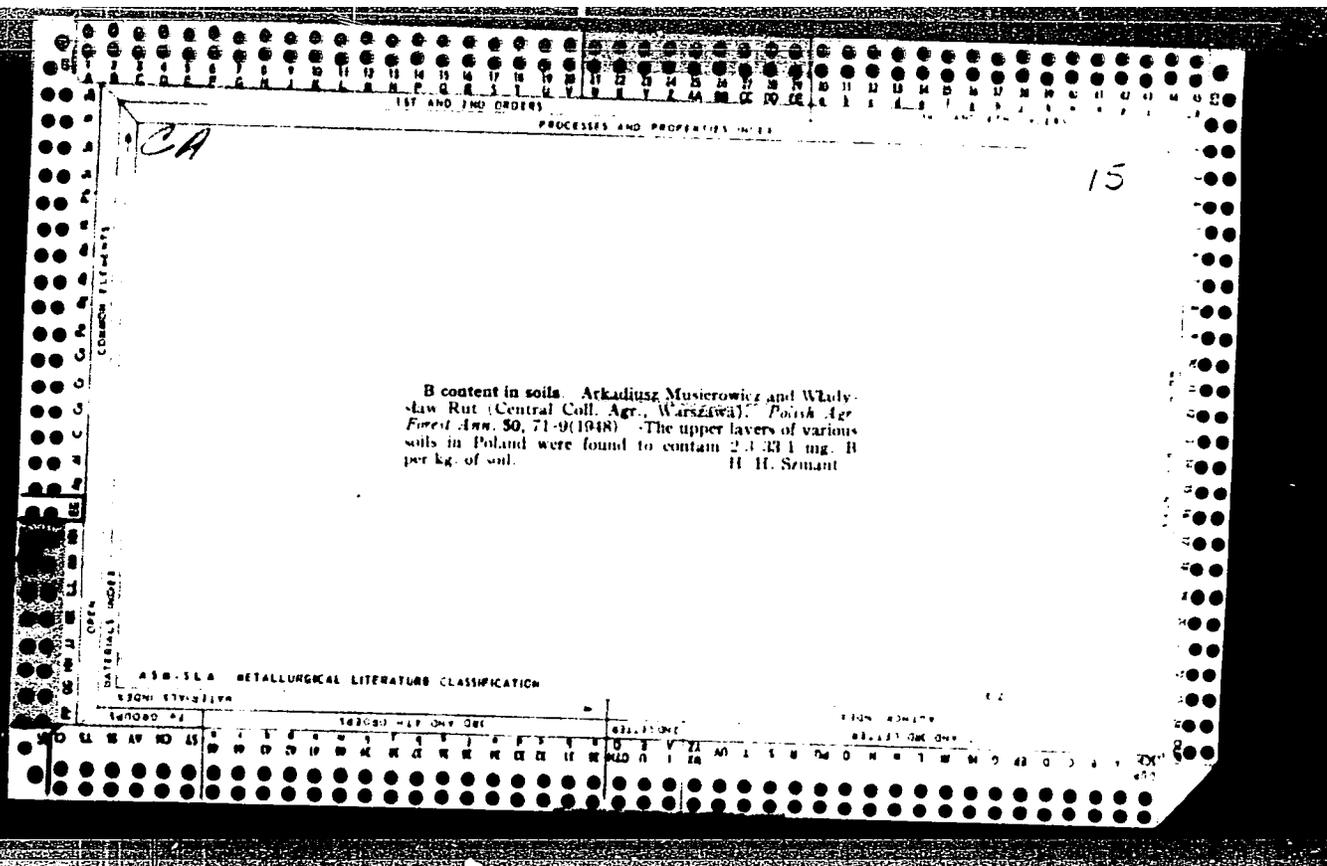


**Studies of the value of brown coal dust as fertilizer.**  
 A. Muzicovskiy. *Trudy Goskuznetsovskogo Nauchno-Issledovatskogo Instituta* No. 6(103) 1952, p. 282-287. On the basis of vegetative tests, M. compares the effect of lignite dust with that of all fertilizers used in the USSR. It is shown that the use of lignite dust as fertilizer is most effective in soils characterized by a low content of humic substances. The effect of lignite dust is especially noticeable in soils upon the development of the plants in an environment having very poor sorption properties (sand soils and sulfate rocks). Under the influence of lignite dust, an increase of yields can be distinctly observed at a sufficient quantity of Ca ions and on a physiologically acid N nutrient as  $NH_4^+$ ,  $SO_4^{2-}$ , N contained in lignite dust cannot be utilized by the plant during the vegetation period on the surface. Lignite dust may be considered as an effective fertilizer agent, especially appropriate for soil characterized by a poor sorption complex.

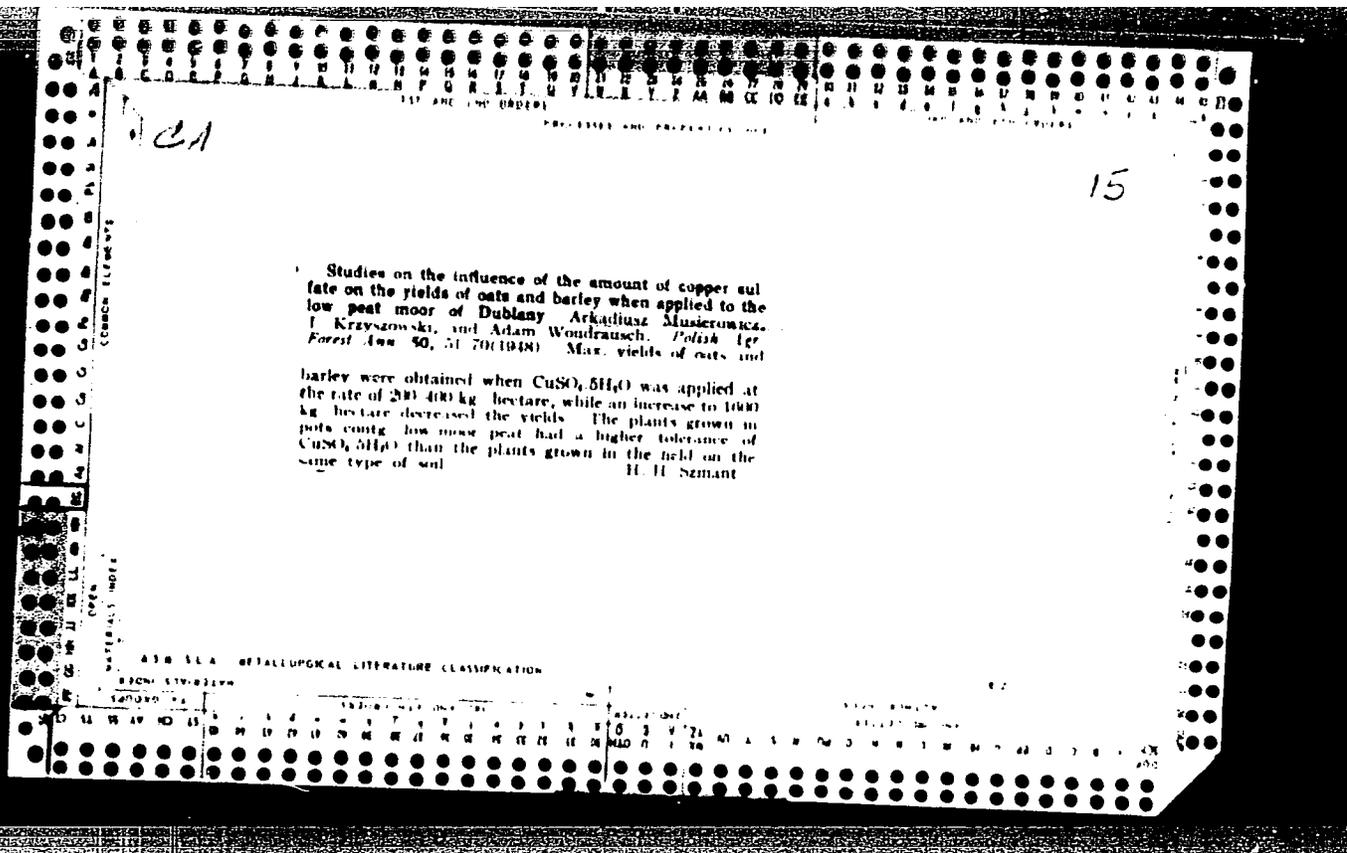
Edward A. Yekremov

AS 5 S L A - METALLURGICAL LITERATURE CLASSIFICATION









MUSIEROWICZ, A.

AG *Humus of soils. A. Musierowicz. Roczniki Nauk Rolniczych OPA, No. 3, 485-505 (1963).*—*M.* discusses various phases of humus formation and compn. The individual phases include sources of org. matter in soils, primarily green plants. The process of mineralization and humification of org. matter is discussed with attention given to the fact that humus can be produced from the secretions of living plants in the rhizosphere. *M.* further reviews the various humus compds. such as humic acids, ulmic acids, fulvic acids, humins, and ulmins; the content of bitumens of specific humus compds. in the upper layers of soils, and the importance of humus for agriculture. Richard Ehrlich

MUSIEROWICZ, A.

"RESEARCH Activities of the Soil Science Stations of the Central School of Agricultural Economy and of the Institute of Cultivation, Fertilization, and Soil Science in Warsaw." p.93 (POSTĘPY WIEDZY ROLNICZEJ, Vol. 5, no. 1, Jan/Feb 1953 Warszawa, Poland)

SO: Monthly List of East European Accessions, Vol. 2, #2, Library of Congress August, 1953, Uncl.

MUSIEROWICZ, A.

Chemical Abst.  
Vol. 48 No.9  
May 10, 1954  
Soils and Fertilizers

②

Determining the solubility (activity) of certain carbonate rocks by electroanalysis. A. Musierowicz, E. Chlonska, K. Kowalska-Bialik, and C. Kowalska. *Rozprawy Nauk Rolniczych 65, Ser. A, No. 7, 81-86 (in Russian 68-9; in English 68-69) (1963).*—Carbonate rocks even of like texture and geol. formation vary in their rates of soln. Among limestones, marls, and dolomites crushed to a particle size of 10 mm. the greatest rate of soln. was reached by chalk limestone, chalk, and chalk marls. Crushed Devonian, marble, chalk, tertiary *Wolynian*, red Devonian, Senonian marl, and Turoonian marl, of particle size 0.25-0.5 mm., should be suitable as Ca fertilizers. Jurassic limestone, Devonian limestone, and dolomite of particle sizes 0.25-0.5 mm. would be slowly acting Ca fertilizers. The properties of rendzina and its agricultural value depend upon the activity and ability to crush the carbonate rock from which the rendzina was derived. E. G. J.

Mussierowicz, A.

AV Study podsol soils of the Warsaw district. A. Mussierowicz  
(Moss. News ref., 1964, 78, A, 1-15).—A description of the pod-  
G<sup>1</sup> parties and agricultural uses of the soils. P. S. Anur.

MUSIEROWICZ, A.

The sorptive and exchangeable cation content of the more important soils of the Warsaw Voivodship. I. II. A. Musierowicz, K. Konecka-Belley, and J. Hojnik (*Rochn. Nauk Roln.*, 1957, 89, A, 5-18, 19-32).--The pH, base exchange data and lime requirement of a series of light sandy soils and of some podsol types are recorded and discussed. A. G. PELLARD.

MUSIEROWICZ, A

The sorptive complex and the exchangeable cation content of the more important soils of the Warsaw Voivodship. I. A. Musierowicz, K. Konecka-Betley, and J. Holuka. Rocznik Nauk Rolniczych Ser. A 69, No. 1, 6-18; 19-32 (1954).—The following data were made on soils of the Warsaw Voivodship: pH<sub>1:0</sub> and pH<sub>1:2.5</sub>; exchangeable and hydrolytic acidity, the quantity and identity of exchangeable cations, the sum of exchangeable bases, cation-exchange capacity, the degree of saturation with exchangeable bases of the sorptive complex of soils, and the lime requirements of soils. Ernest G. Jarrowski

2

MUSIEROWICZ, A.

A classification of the soils of Poland established by the Polish Society on Soil Science, p. 3. (ROCZNIKI GLEBOZNAWCZE, Warszawa, Vol. 3, 1954.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 6, Jan. 1955, Uncl.

MUSIEROWICZ, A.

Fundamentals of the origin and formation of soils. p. 169.  
Vol. 1, no. 2, 1955 Warszawa  
SERIA B: PRZYROD A NEOZYWIONA

SOURCE: East European Accession List (EEAL) Library of Congress  
Vol. 5, no. 8, August 1956

MUSIEROWICZ, A.: SWIECICKI,C.: HAMMY,J.

MUSIEROWICZ, A.: SWIECICKI,C.: HAMMY,J. Certain physical properties  
of the more important soils of Polish lowlands and  
plateaus. p.77.

Vol. 4, 1955  
ROCZNIKI GLEBOZNAWCZE  
A GRICULTURE  
Warszawa, Poland

So: East European Accession, No. 5 Vol. 5, May 1956

MUSTEROWICZ, A.

Changes in phosphorus compounds in soil and assimilation by  
MD plants. A. Musterowicz (Roczn. Nauk. rol., 1955, 76, A, 557-581).  
A critical review. The nature and sorption of org. and inorg.  
sources of P in soils are considered in relation to fertiliser action.  
A. G. POLLARD.

Musirowicz, A.

The cationic complex and the exchangeable cation content of the more important soils of the Warsaw area. A. Musirowicz and K. Konecka-Botley (*Roenn. Nauk rol.*, 1955, A, 71, 493-508).—Data for seven profiles of alluvial soils, recorded, include  $pH_{H_2O}$ ,  $pH_{KCl}$ , exchangeable bases, exchange capacity, lime requirement, P sol. in 20% HCl and the proportions of kaolin and montmorillonite.

A. G. POLLARD

*api* 2

Musierowicz, Arkadiusz

AC ✓ Phosphorus compounds in the soil, their changes and assimilation by plants. Arkadiusz Musierowicz. Roczniki Nauk Rolniczych Ser. A. 10. 337-341 (1933). A detailed discussion is presented on the sources of P in the soil, mineral P compds. in the soil, biol. and chem. sorption of phosphoric acid anions in the soil, exchangeable sorption, and on increasing the action of P fertilizers in soils. E. G. I.

MUSIEROWICZ, A.

The sorptiva complex and the exchangeable-cation contents of the more important soils of the Warsaw Voivodship. IV. Investigation of the black soils. A. Musierowicz, T. Skorupska, and H. Król (Zakład Gleboznawstwa, IUNG i SGGW, Warsaw). Roczniki Nauk Rolniczych Ser. A 72, 186-77(1955)(English summary); cf. C.A. 49, 15130s-186-77(1955)(English summary); cf. C.A. 49, 15130s-186-77(1955)(English summary). Seven different spot samples were taken at various depths (up to 150 cm.) and analyzed for granulometry, loss of H<sub>2</sub>O upon heating, Ca, Mg, K, pH in H<sub>2</sub>O and KCl soln., N, CaCO<sub>3</sub>, C/N, the exchangeable cations, % sol. in 20% HCl and the Fe<sub>2</sub>O<sub>3</sub> and Fe<sub>2</sub>O<sub>3</sub> + Al<sub>2</sub>O<sub>3</sub> in such soln., montmorillonite and kaolinite according to the Tokarski method (C.A. 48, 11690f), humus, and hydrolytic sorptive capacity. Formulas are presented for calcg. approx. the exchangeable sorptive and hydrolytic sorptive capacities from the sum of exchangeable bases and the hydrolytic acidity. W. J.

3

POLAND/Soil Science - Soil Genesis and Geography.

J.

Abs Jour : Ref Zhur - Biol., No 4, 1958, 15245

Author : A. Muserovich, Z. Ol'shevskiy, F. Kuznitskiy, C. Sventsitskiy, K. Konetskaya-Betley, F. Leshchinskaya

Inst : -

Title : The Soils of Warsaw Province.  
(Pochvy Varshavskogo voyevodstva).

Orig Pub : Roczn. nauk rolniczych, 1955, D75, 5-238

Abstract : Based on field and laboratory research, the conditions are described for soil formation; morphological and several physicochemical properties of various types of soil within the borders of Warsaw Province are treated. The following types of soil are classified:  
1) the browns; 2) the turf-podzolics; 3) the chernozems (dark-colored soils); 4) the swamp soils; 5) flood-land soils (mady).

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10

MUSEROVICH, A.Ya.

Achievements of the Polish soil science in the last decade.  
Pochvevedenie no.5:98-106 My '56. (MIRA 9:9)

1.Akademiya nauk Pol'skoy Narodnoy Respubliki.  
(Poland--Soil research) (Soils--Classification)

MUSIEROWICZ, A.

✓ Sorptive complex and cation exchange in brown soils of the Warsaw voivodship. A. Musierowicz and K. Koncek-Betley. *Roczniki Nauk Rolniczych Ser. A* 72, 533-47 (1966) (English summary); cf. *C.A.* 49, 1513s.—The following data regarding the brown soils of the Warsaw voivodship are presented:  $pH_{H_2O}$ ,  $pH_{CaCl_2}$ ,  $CaCO_3$ , humus content, montmorillonite content, kaolinite content, hydrolytic acidity; mech. compn., quant. and qual. compn. of exchangeable cations, quant. sum of exchangeable bases, cation exchange and hydrolytic capacity, and coeffs. on the basis of which it is possible to compute indirectly the sorptive and hydrolytic capacity. Ernest C. Jaworski

2

MUSIEROWICZ, A.

Soils of the voivodship of Warsaw. A. Musierowicz, Z. Olszewski, P. Kuznicki, C. Święciecki, K. Konecka-Belley, and B. Leszczyńska. *Roczniki Nauk Rolniczych Ser. D* 73, 1-288(1956)(English summary). The characteristics are discussed of the climate, geol. structure of parent rocks, and properties of the soils that occur on the area of the Voivodship of Warsaw. Ernest G. Jaworski

6

POLAND / Soil Science. Biology of Soils.

J-3

Abs Jour : Ref. Zhur - Biologiya, No 17, 1958, No. 77403

Author : Musierowicz, Arkadiusz

Inst : Not given

Title : Humus in Soils

Orig Pub : Postepy nauk roln., 1957, 4, No 2, 3-36

Abstract : The current status of investigations of humus is discussed. The following basic problems are examined: sources of organic substances in the soil, processes of mineralization and humification of organic substances in soils, types of humus of soil and overlay (floor); content of humus in the basic soil types of Poland; composition of humus substances, and significance of humus in agriculture.

Card 1/1

25

POLAND / Soil Science. Genesis and Geography of Soils.

J-1

Abs Jour : Ref Zhur - Biologiya, No 16, 1958. No. 72623

Author : Musierowicz, Arkadiusz

Inst : Not given

Title : Report of meetings of the V Commission of Genesis and  
Classification of Soils of the VI International Soil  
Congress in Paris (1/29-9/6/56)

Orig Pub : Postepy nauk roln., 1957, 4, No 3, 89-111

Abstract : Lists are cited of reports and their generalized content  
according to divisions. 1. The soil-formation process  
and factors conditioning it. 2. Classification and  
rating of soils. 3. Properties of different types of  
soils of the world. Basic positions are set forth of  
reports of Soviet scientists. -- Z. I. Zhurbitskiy

Card 1/1

MUSIEROWICZ, A.

The achievements and present tasks of soil science in Poland after the Second World War. p. 7

NUKLEONIKA. (Polska Akademia Nauk. Komitet do Spraw Pokojowego Wykorzystania  
Energii Jadrowej)  
Warszawa. Vol. 3, no. 2, 1958  
Poland/

Monthly List of East European Accessions Index (EEAI), LC, Vol. 8, no. 6, June 1959  
Uncl.

MUSIEROWICZ, Arkadiusz

Who's who in the Polish Academy of Sciences. Review Pol Academy  
4 no.3:93-99 '59. (KEAI 9:6)

(Polish Academy of Sciences)  
(Stach, Jan Waclaw)  
(Tempka, Tadeusz)  
(Musierowicz, Arkadiusz)

MUSIEROWICZ, A.; Krol, H.

Studies on the sorption complex and the content of exchangeable cations in more important soils of the Lodz Voivodeship. p. 11.

ROZNIKI GLEBOZNAWICZE. (Polskie Towarzystwo Gleboznawcze) Warszawa <sup>POLAND</sup> Vol. 8,  
no. 1, 1959.

Monthly List of East European Accessions (FEAI) LC, Vol. 9, no. 1. Jan. 1960.

Encl.

MUSEROVICH, A.; BROGOVSKI, S.; SKORUPSKA, T.

Study of organic matter in bound Podzolic sandy soils.  
Pochvovedenie no.2:89 F '60. (MIRA 15:7)  
(Humus) (Podzol)

MUSIEROWICZ, Arkadiusz; KWIATEK, Aldona

Studies on the content of mineral and phosphorous compounds in  
some podsol soils developed from glacial clays in Lods  
Voivodeship. Rocznik nauki rolno-lesnej 82 no.1:27-43 '60. (EAI 10:7)

1. Zaklad Gleboznawstwa Szkoły Glownej Gospodarstwa Wiejskiego  
w Warszawie.

(Poland--Podsol) (Minerals) (Phosphorus) (Clay)

MUSEROVICH, A. [Musierowicz, A.]; KUZ'NITSKI, F. [Kuznicki, F.], doktor  
(Pol'sha)

Magnesium content of Polish soils. Agrobiologia no. 1:108-  
113 Ja-F '61. (MIRA 14:2)

1. Varshavskaya glavnyaya sel'skokhozyaystvennaya shkola, Kafedra  
pochvovedeniya. 2. ~~Cheln~~-korrespondent Vsesoyuznoy akademii  
sel'skokhozyaystvennykh nauk imeni V.I. Lenina (for Muserovich)  
(Poland--Soils--Magnesium content)

MAKSIMOW, Aleksander; MUSIEROWICZ, Arkadiusz

On the organization of scientific work and research problems of colleges of agriculture and the Institute for Pedology and Agricultural Chemistry in Yugoslavia. Postepy nauk roln 8 no.5:119-122 S-0 '61.

(Yugoslavia--Agriculture)

MUSIEROWICZ, Arkadiusz; KUZNICKI, Franciszek

Magnesium in soils of the Mazowiecko-Podlaska and Wielkopolsko-Kujawska Lowland Plains. Rocznik nauki rolno-lesnej 82 no.2:251-306 '61.

1. Zakład Gleboznawstwa, Szkoła Główna Gospodarstwa Wiejskiego, Warszawa.

MUSIEROWICZ, A.; OLSZEWSKI, Z.; BROGOWSKI, Z.; KEPKA, M.

The black earths of the Blonie, Sochaczew and Lowica regions. Rocznik roln i Politechniki Warszawskiej 82 no.3:503-562 '61.

1. Zaklady Gleboznawstwa Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie i Politechniki Warszawskiej.

MUSEROVICH, A.Ya.; KIYAK, G.S.

Bogs and vegetation of the Marunka Valley near Lvov, their  
utilization and improvement. Ukr.bot.zhur. 19 no.1:84-93 '62.  
(MIRA 15:4)

1. L'vovskiy sel'skokhozyaystvennyy institut, kafedra pochvovedeniya  
i agrokhimii.

(Lvov region--Swamps)

MUSIEROWICZ, A.; SWIECICKI, Cz.

Boron content in typical soils of Lodz Voivodeship. Rocznik  
nauk roln rosl 87 no.2:153-181 '63.

1. Katedra Gleboznawstwa, Szkoła Główna Gospodarstwa  
Wiejskiego, Warszawa.

MUSIEROWICZ, J.

Acetone from Acetylene and Water, Part II by A. MAJCZEWSKA, H. STEBNER,  
J. MUSIEROWICZ and E. TRZESZCZANOWICZ, Page 463, Przemysl Chemiczny, No. 1, 1957

Musierowicz, J.

Acetone from acetylene and steam. I. K. Marczewska,  
 J. Musierowicz, H. Stegner, and E. Toczczanowicz (Inst.  
 Chem. Ogólnej, Warsaw). *Przemysł Chém.* 13, 495-10  
 (1987) (English summary). A pilot-plant installation is  
 described for the synthesis of acetone from dil.  $C_2H_2$  based  
 on the method used at Oppau, Germany.  $C_2H_2$  is obtained  
 from partial burning of methane which is a cheap raw ma-  
 terial in Poland. A full-scale plant working on this method  
 was recently constructed in Hungary. The empirical equa-  
 tion for the synthesis is:  $C_2H_2 + 1.31 H_2O \rightarrow 0.47 CH_3CO-$   
 $CH_3 + 0.09 CH_3CHO + 0.41 CO_2 + 0.57 CO + 0.99 H_2$ .  
 The reaction is exothermic and is carried out with 10-fold  
 excess of steam at 450°. In order to prevent polymerization  
 of  $C_2H_2$  the temp. on the catalyst should not exceed 500°.  
 A catalyst was prepd. by mixing 1 part of contact mass used  
 for the conversion of water gas with 3 parts of ZnO (Zn  
 white). The compon. of the mixt. was: Zn 60, Fe 14, and  
 Cr 1.3% by wt.; it was pelleted to 8 mm. diam. x 6 mm.,  
 bulk d. before activation 1.68, after activation 1.62, and,  
 after using them for 60 hrs., 1.09 g/cc. The activation  
 was carried out by blowing air and steam at 420-40°  
 through the pellets. Regeneration was carried out with air  
 and steam at 480-500°.

6  
453d

J. Hendel

MARCZEWSKA, Kazimiera; MUSIEROWICZ, Jerzy

Pyrolysis of liquid hydrocarbons toward gaseous olefins.  
Przem chem 39 no.2:97-104 F '60.

1. Zaklad Syntezy Kontaktowej, Instytut Chemii Ogolnej, Warszawa.

P/014/61/040/003/005/005  
A221/A126

AUTHORS: Marczewska, Kizimiera and Musierowicz, Jerzy

TITLE: The influence of partial pressure variations of hydrocarbons on the course of pyrolytic olefine processes

PERIODICAL: Przemysł Chemiczny, no. 3, 1961, 150-153

TEXT: In this article the authors report on their research into pyrolysis of olefines. The purpose was to investigate the course of this process at various partial pressures of hydrocarbons and the yield of individual products. It was the continuation of their research on liquid-hydrocarbon destruction, part of which has been published in the beginning of 1960. The reduction of partial pressure of hydrocarbons during these experiments was achieved by addition of steam or by application of negative pressure. For the actual investigation gas oil from Muchanovsk was used. To sum up the results balance tables (Table 2 and 3) were compiled for pyrolysis processes carried out at various partial pressures of hydrocarbons. Partial pressure was produced by adding steam in quantities corresponding to 6, 25 and 110% by weight of the Card 1/5

P/014/61/040/003/005/005  
A221/A126

The influence of ...

initially used raw material and by reducing the pressure in the reactor to 0.2 atm, but without adding steam.

Table 2

Products in % by weight of initial raw materials								Hydro carbon part. press. atm.	Steam added in % by weight of raw materials
Gaseous products					Post crack ing oils	Coke and los ses	Total		
Total	Ole-fines	Hydro gen	Alk-anes	Others					
51.4	37.6	0.3	12.5	1.0	43.6	5.0	100	0.67	6
54.4	40.7	0.5	12.0	1.2	42.0	3.6	100	0.42	25
55.7	42.0	0.6	11.6	1.5	41.3	3.0	100	0.17	110
60.2	47.4	0.6	10.5	1.7	37.8	2.0	100	0.2	-

Table 2. The balance of pyrolysis products from Mukhanovsk crude gas oil carried out at various partial pressures of hydrocarbons ( $\tau = 0.8$  sec.  $t \sim 800^\circ\text{C}$ )

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The influence of ...

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A221/A126

Table 3

Distribution of hydrogen from raw materials between post-cracking products, % by weight					Partial pressure of hydrocarbons atm.	Steam added in % by weight of raw materials
Olefines C <sub>2</sub> -C <sub>4</sub>	Gaseous alkanes	Free hydrogen	Other gaseous products	Post-cracking oil + coke		
41.9	24.4	2.3	0.2	31.2	0.67	6
45.3	23.4	3.9	0.3	27.1	0.42	25
46.8	22.6	4.7	0.2	25.7	0.17	110
52.8	20.5	4.7	0.2	21.8	0.2	-

Table 3. Hydrogen balance for pyrolytic processing of gas oil from Mukhanovsk crude, carried out at various partial pressures of hydrocarbons ( $\tau = 0.6$  sec,  $t \sim 800^\circ\text{C}$ )

Card 3/5

The influence of ...

P/014/61/040/003/005/105  
A221/A126

The reduction of the partial pressure of hydrocarbons during the pyrolysis process facilitates better distribution of hydrogen between the resulting products. This was particularly noticeable when reduced pressure was applied without addition of steam. In the latter case the output of alkanes increased to 47% and the amount of post-cracking oils dropped to 38%. On the other hand, in processes during which the equally low partial pressure was produced by addition of 110% by weight of steam, the output of olefines was only 43% and at the same time more liquid products (41%) were obtained. In general, carrying out the pyrolysis at reduced pressure shows many advantages. Final evaluation, however, will be made after the proper reactor is designed. Chromatographic analyses were carried out by Engineer R. Pawlowski from the Zakład Syntezy Kontaktowej I.Ch.O. (Institute of General Chemistry, Contact Synthesis Department). The authors express their thanks to Professor Edward Treszczanowicz, Head of the Contact Synthesis Department, for his advice. There are 3 tables, 5 figures and 36 references: 16 Soviet-bloc and 20 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: G. Akin, T. Reid, R. Schrader, Chem.Eng. Progr., 54,41 (1958), E.B. Schulz, J.J. Guyer, Card 4/5

The influence of ...

P/014/61/040/003/003/003  
A281/A126

H.P. Linden, Ind. Eng. Chem., 47, 2479 (1955), Oil Gas J., 54, nr 35, 113  
(1956), K. Kearby, The Chemistry of Petroleum Hydrocarbons, New York  
1955.

ASSOCIATION General Chemistry Institute, Contact Synthesis Department,  
Warsaw.

SUBMITTED. December 24, 1960

Card 5/5

7  
 ✓ Organophosphorus compounds of sulfur and selenium.  
 X. Action of sulfur chloride on alkyl hydrogen alkylphosphonothioates and dialkylphosphonothioic acids. Synthesis of *p*-alkoxy-*p*-alkylphosphoranesulfonyl chlorides. Cf. Iurecki, J. Michalski, and St. Musierowicz (Tech. Univ., Łódź, Poland). *J. Chem. Soc.* 1958:4051-8; cf. preceding abstr.—SO<sub>2</sub>Cl<sub>2</sub> with R(R'O)PSOH (I) gave RPO(OR')SCI (II) or [RPO(OR')S]<sub>2</sub> (III). R<sub>2</sub>PSOH (IV) with SO<sub>2</sub>Cl<sub>2</sub> gave R<sub>2</sub>POCl (V) or R<sub>2</sub>PSOPOR<sub>2</sub> (VI). The nomenclature used is based on the hypothetical phosphorane PH<sub>3</sub> and the radical phosphonyl, PH<sub>2</sub>(O)•. SO<sub>2</sub>Cl<sub>2</sub> (27 g.) in 30 ml. C<sub>6</sub>H<sub>6</sub> added dropwise to 30.8 g. I (R = R' = Et) (VII) in 100 ml. C<sub>6</sub>H<sub>6</sub> at -5 to 0° (external cooling), the solvents and gaseous products evapd. *in vacuo*, and the products distd. gave 70% II (R = R' = Et) (VIII), b<sub>p</sub> 33-4°, n<sub>D</sub><sup>20</sup> 1.4800, d<sub>4</sub> 1.2312. BuEtPO<sub>2</sub>H (74.3 g.) in 160 ml. EtOH contg. 11 g. Na treated slowly with 15 g. S with cooling, the filtered soln. evapd. *in vacuo*, the crude Na salt taken up in 50 ml. H<sub>2</sub>O and acidified with 90 ml. 20% HCl, the free acid extd. 3 times with 70 ml. C<sub>6</sub>H<sub>6</sub>, the exts. evapd. *in vacuo*, and the residue distd. gave 61.5 g. Bu(Et)PSOH (IX), b<sub>p</sub> 76°, n<sub>D</sub><sup>20</sup> 1.4821, d<sub>4</sub> 1.0683. IX (18 g.) in 60 ml. C<sub>6</sub>H<sub>6</sub> treated dropwise at -10 to -5° (external cooling) with 13.5 g. SO<sub>2</sub>Cl<sub>2</sub> in 40 ml. C<sub>6</sub>H<sub>6</sub>, the solvent evapd., and the residue distd. *in vacuo* yielded 55% II (R = Et, R' = Bu), b<sub>p</sub> 74°, n<sub>D</sub><sup>20</sup> 1.4528. VIII (26.4 g.) heated at 60-70°/1 mm. with pptn. of S and distd. gave 15.5 g. material, redistd. *in vacuo* to give the known EtPO(OEt)Cl, b<sub>p</sub> 35-6°, n<sub>D</sub><sup>20</sup> 1.4402. SO<sub>2</sub>Cl<sub>2</sub> (8.15 g.) in 20 ml. C<sub>6</sub>H<sub>6</sub> added dropwise to 11.75 g. VII in 60 ml. C<sub>6</sub>H<sub>6</sub> at 0°, the solvent and gaseous products removed *in vacuo*, and the residue distd. gave 98% III (R = R' = Et) (X), n<sub>D</sub><sup>20</sup> 1.5061. VIII (9.47 g.) in 100 ml. C<sub>6</sub>H<sub>6</sub> added

dropwise to 11.75 g. VII in 60 ml. C<sub>6</sub>H<sub>6</sub> at 0°, the solvent and gaseous products removed *in vacuo*, and the residue distd. gave 98% III (R = R' = Et) (X), n<sub>D</sub><sup>20</sup> 1.5061. VIII (9.47 g.) in 100 ml. C<sub>6</sub>H<sub>6</sub> added dropwise to 7.79 g. VII in 70 ml. C<sub>6</sub>H<sub>6</sub> at -5 to 0°, the solvent evapd. *in vacuo*, and the residue distd. yielded 98% X. X (15.2 g.) heated at 120°/0.05 mm. and the product distd. yielded 75% authentic EtPS(OEt)OPEt(OEt) (XI). The structure of the anhydride XI was confirmed by comparison with compd. prepd. by the action of H<sub>2</sub>S on alkyl alkylphosphonochlorides, RPO(OR')Cl (XII), in the presence of tertiary bases according to Michalski (*C.A.* 50, 10641a). S (16.2 g.) added portionwise to 63.5 g. Et<sub>3</sub>PCl in 250 ml. C<sub>6</sub>H<sub>6</sub> at 18-24°, the solvent evapd., and the residue distd. yielded 89% Et<sub>3</sub>PSCl (XIII), b<sub>p</sub> 94-5°, n<sub>D</sub><sup>20</sup> 1.5292. XIII (45 g.) treated dropwise with 25 g. NaOH in 50 ml. H<sub>2</sub>O at 30-40°, the soln. acidified with 20% HCl and the product added to the 3 washings of the aq. layer with 50 ml. C<sub>6</sub>H<sub>6</sub>, the soln. evapd., and the residue distd. yielded 78% Et<sub>2</sub>PSOH (XIV), b<sub>p</sub> 67-8°, n<sub>D</sub><sup>20</sup> 1.5257; cyclohexylamine salt m. 145-7°. SO<sub>2</sub>Cl<sub>2</sub> (14.6 g.) in 50 ml. C<sub>6</sub>H<sub>6</sub> added dropwise to 15 g. XIV in 50 ml. at -8 to -2° with pptn. of S, the solvent evapd., and the residue distd. gave 10.2 g. V (R = Et) (XV), b<sub>p</sub> 90-8°, n<sub>D</sub><sup>20</sup> 1.4682. SO<sub>2</sub>Cl<sub>2</sub> (6.5 g.) in 20 ml. C<sub>6</sub>H<sub>6</sub> added dropwise to 13.4 g. XIV in 30 ml. C<sub>6</sub>H<sub>6</sub> at 0°, the mixt. kept 1 hr. at room temp., the filtered soln. evapd., and the residue distd. yielded 59% VI (R = Et) (XVI), b<sub>p</sub> 94-5°, n<sub>D</sub><sup>20</sup> 1.5030. XIV (8 g.) in 8 ml. C<sub>6</sub>H<sub>6</sub> added dropwise to 8.1 g. XV in 7 ml. C<sub>6</sub>H<sub>6</sub> at 15-20°, the HCl and solvent evapd. *in*

Distr. AE2c(j)

*vacuo*, and the residue distd. gave 96% XVI. XVI (3.7 g.) in 10 ml.  $C_6H_6$  treated dropwise with 2.1 g.  $SO_2Cl_2$  in 10 ml.  $C_6H_6$  at  $-2$  to  $0^\circ$ , the filtered soln. evapd., and the residue distd. gave 48% XV,  $b_p$   $104^\circ$ ,  $n_D^{20}$  1.4668. Alc. NaOEt (3.35 g. Na in 100 ml. alc.) treated with 33 g.  $(PhCH_2)_2PHO$  in 200 ml. alc., the mixt. stirred with portionwise addn. of 5.3 g. S at  $30-5^\circ$ , the stirring continued 2 hrs., the filtered soln. evapd. *in vacuo*, and the product crystd. (alc.) gave  $(PhCH_2)_2PSO_2Na$ , m.  $232-6^\circ$ . The salt (31 g.) in 200 ml.  $H_2O$  decompd. by excess HCl at  $0^\circ$  gave  $(PhCH_2)_2PS-OH$  (XVII), m.  $100-1^\circ$  (1:10 alc.  $C_6H_6$ ). XVII (5.24 g.) in 120 ml.  $CCl_4$  at  $-25$  to  $-20^\circ$  treated dropwise with 2.7 g.  $SO_2Cl_2$  in 30 ml.  $C_6H_6$ , the solvent evapd. at  $0^\circ$  *in vacuo* with pptn. of S, the filtered soln. hydrolyzed by addn. of a few drops of water, and the product crystd. ( $C_6H_6$ ) gave authentic  $(PhCH_2)_2PO_2H$ , m.  $191-3^\circ$ . C. R. Addinall

MUSIEROWICZ, S.

Distr: 4E2c(j)/4E3d

Organophosphorus compounds of sulfur and selenium. Addition of dialkylphosphinylsulfenyl chlorides and alkylalkoxyphosphinylsulfenyl chlorides to symmetrical olefins. J. Michalski, B. Borecka, and S. Musierowicz (Politech. Univ., Pol.). Bull. acad. polon. sci., Ser. sci. Chim., Geol. et Geograph. 6, 159-63(1958)(in English).—The addn. of organophosphorus compds. with a P(O)SCI group (cf. C.A. 52, 9945k) to sym. olefins has been studied. By addn. of (RO)<sub>2</sub>P(O)SCI (I) or R'(RO)P(O)SCI (II) to C<sub>2</sub>H<sub>4</sub> (III), Me<sub>2</sub>C=CMe<sub>2</sub> (IV), or cyclohexene, the following compds. have been prepd. (yield, b.p./mm., n<sub>D</sub><sup>20</sup>, d<sub>4</sub> given): (EtO)<sub>2</sub>P(O)SCH<sub>2</sub>CH<sub>2</sub>Cl (V), 84, 88°/0.00, 1.4785, 1.2270 (Morison, C.A. 50, 780k); (EtO)<sub>2</sub>P(O)SCMe<sub>2</sub>CMe<sub>2</sub>Cl, 60,

67°/0.02, 1.4840, 1.1108; (PrO)<sub>2</sub>P(O)SCH<sub>2</sub>CH<sub>2</sub>Cl, 77, 72°/0.005, 1.4751, 1.1057; (PrO)<sub>2</sub>P(O)SCMe<sub>2</sub>CMe<sub>2</sub>Cl, 40, 86°/0.01, 1.4358, 1.0908 at 25°; (iso-PrO)<sub>2</sub>P(O)SCH<sub>2</sub>CH<sub>2</sub>Cl, 70, 100°/0.9, 1.4680, 1.4262; (BuO)<sub>2</sub>P(O)SCH<sub>2</sub>CH<sub>2</sub>Cl, 66, 92.5°/0.015, 1.4731, 1.1208; Et(EtO)P(O)SCH<sub>2</sub>CH<sub>2</sub>Cl (VI), 74, 64°/0.05, 1.4958, 1.1941; Et(BuO)P(O)SCH<sub>2</sub>CH<sub>2</sub>Cl, 75, 80°/0.05, 1.4885, 1.1333 at 25°; (EtO)<sub>2</sub>P(O)SR (R = 2-chlorocyclohexyl), 82, 61°/0.1, 1.4963, 1.1948; PhCHClCHPhSP(O)(EtO)<sub>2</sub> (VII), 58, m. 98-9° (repeatedly from C<sub>6</sub>H<sub>6</sub>). —. E.g.: I (R = Et) (20.4 g.) dild. with 30 ml. C<sub>6</sub>H<sub>6</sub>, kept at 5-10°, pure III introduced until the yellow color disappeared, the soln. washed with H<sub>2</sub>O, satd. NaHCO<sub>3</sub>, and H<sub>2</sub>O, dried, and the C<sub>6</sub>H<sub>6</sub> evapd., gave V. The synthesis of VI was performed at 10-20°; that of VII required 3 days' exposure to light.

J. Stecki

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MUSIEROWICZ, S.

Organophosphorus compounds of sulfur and selenium  
 IX. Addition of dialkylphosphinylsulfenyl chlorides and  
 alkylalkoxyphosphinylsulfenyl chlorides to symmetrical  
 olefins. Barbara Lenard-Borecka, Jan Michalski, and  
 Stanislaw Musierowicz (Polish Acad. Sci., Łódź); *Kocwiski  
 Chem. Z.* 1901-9, 1968 (English Summary); cf. *C.A.* 51:  
 2234a, 55, 10012a, 16256c. — Dialkylphosphinylsulfenyl  
 chlorides,  $(RO)_2P(O)SCl$  (I), and alkylalkoxyphosphinyl-  
 sulfenyl chlorides,  $R(RO)P(O)SCl$  (II), add spontaneously  
 and exothermally to  $C_6H_6$  (III),  $(Me.C)_6$ , and cyclohexene.  
 The reaction with stilbene requires irradiation by sunlight.  
 E.g. 20.4 g.  $(EtO)_2P(O)SCl$  in 30 ml.  $C_6H_6$  with III (gas) at  
 $5-10^\circ$  gave, after distn., 19.7 g. (94.5%)  $(RO)_2P(O)SCH_2-$   
 $CH_2Cl$  (R = Et) (IV), b.p.  $68^\circ$ ,  $n_D^{20}$  1.4785,  $d_4^{20}$  1.2276.  
 The following analogs of IV were prepd. (R, b.p./mm.,  
 $n_D^{20}$ , % yield): Pr,  $72^\circ/0.005$ , 1.4751, 1.1657, 77; *iso-Pr*,  
 $100^\circ/0.9$ , 1.4690, 1.1462, 86; Bu,  $95.2^\circ/0.01$ , 1.4731,  
 1.1208, 66. The following were also prepd.: Et(*EtO*)P(O)-  
 $SCH_2CH_2Cl$ ,  $64^\circ/0.05$ , 1.4958, 1.1041, 74;  $(EtO)_2P-$   
 $(O)SCH_2CMe_2CMe_2Cl$ ,  $67^\circ/0.02$ , 1.4840, 1.1106, 60; Et-  
 $(BuO)_2P(O)SCH_2CH_2Cl$ ,  $80^\circ/0.05$ ,  $n_D^{20}$  1.4985,  $d_4^{20}$  1.1333,  
 75;  $(i-PrO)_2P(O)SCH_2CMe_2CMe_2Cl$ ,  $85^\circ/0.01$ ,  $n_D^{20}$  1.4858,  $d_4^{20}$   
 1.0906, 40;  $(EtO)_2P(O)SCH_2C_6H_4Cl-o$ ,  $91^\circ/0.1$ , 1.4963,  $d_4^{20}$   
 1.1948, 62;  $(EtO)_2P(O)SCH_2PhCl$ , m.  $98-9^\circ$ , yield 52%.  
 The structure of IV was verified by synthesis by Morrison's  
 method (*C.A.* 50, 789h), and by oxidative chlorination ac-  
 cording to Stirling, (*C.A.* 52, 1455g). The compds. in-  
 hibit cholinesterase activity and do not possess any bilater-  
 ing property.  
 Czeslaw Bankiewicz

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